

## **The Low-Range Differential Pressure (LRDP) Leak Detection System**

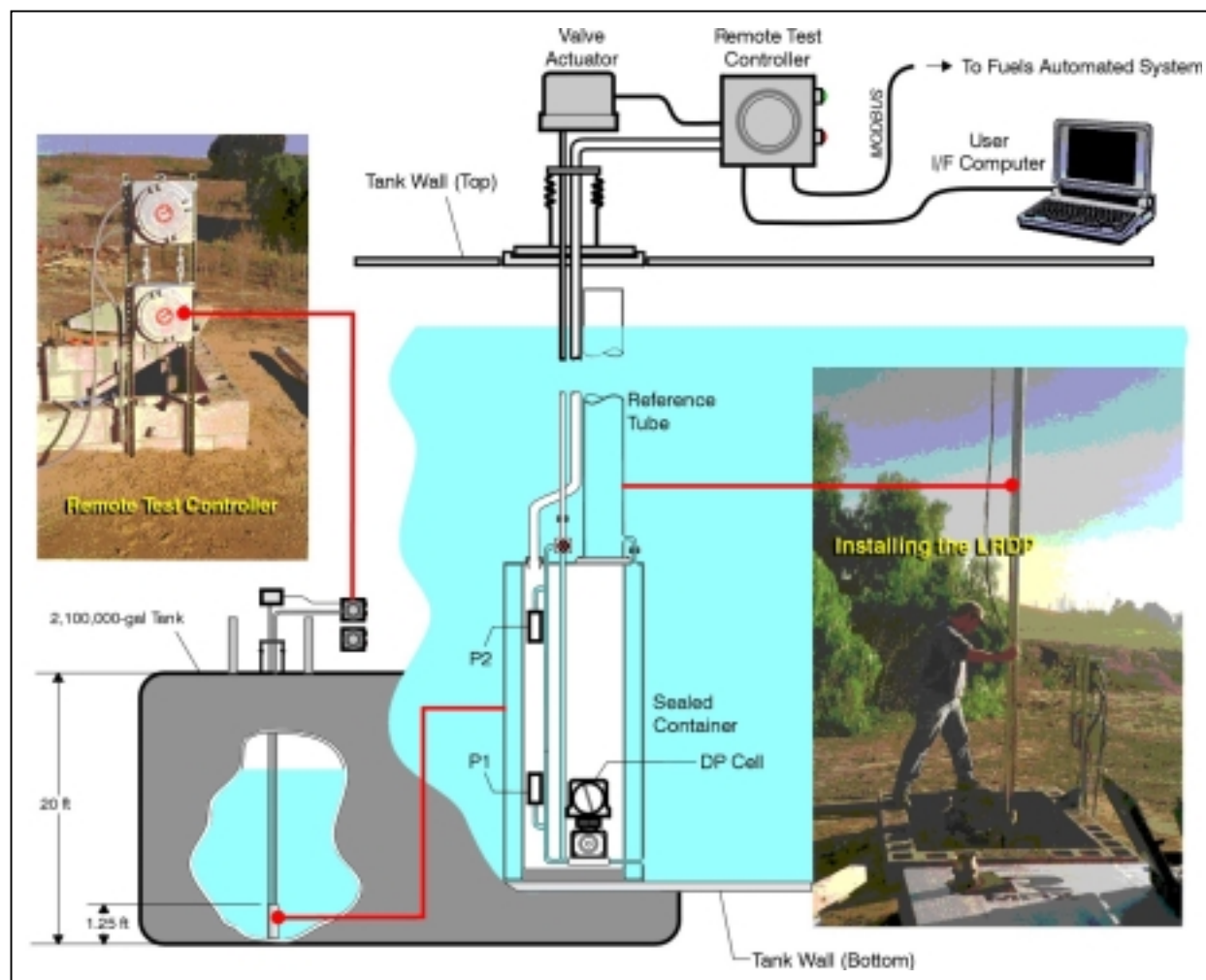
**Introduction.** The Low-Range Differential Pressure (LRDP) system is a mass-based, leak detection and monitoring system that was developed to reliably detect small leaks in *bulk* underground storage tanks (USTs). If a tank is leaking, the LRDP quantitatively measures the leak rate in gallons per hour.

The LRDP system was co-developed by the Naval Facilities Engineering Service Center (NFESC) and is being readied for commercial use under the DOD program called the Environmental Security Technology Certification Program (ESTCP). The ESTCP program is designed to demonstrate and validate new, innovative technologies that can be used to address environmental and regulatory problems at all DoD military facilities.

The LRDP was initially developed for the world's largest USTs, which are owned and operated by the U. S. Navy. The Red Hill tanks, buried over 100 feet deep in the hills above Honolulu, Hawaii, each contain 12.5 million gallons of fuel and are 100 feet in diameter and 250 feet in height. However, the main use of the LRDP is to test the 300 or so bulk USTs owned and operated by DoD at facilities throughout the world. A set of *third-party* evaluations of the performance of the LRDP system was conducted following standard EPA and ASTM procedures for bulk storage tanks. These evaluations were certified by the National Work Group for Leak Detection Evaluation (NWGLDE) for testing tanks as small as 50,000 gallons and for tanks with diameters up to 140 feet and capacities of up to four million

**Description of the LRDP.** The LRDP system is shown in Figure 1. It consists of an in-tank sensor unit to make the measurements, a local controller to implement and analyze the data from a test, and a host computer to initiate, report, and archive the results of a test. The LRDP is also being integrated in the DoD Fuels Accounting System (FAS) so that it is compatible with DoD bulk storage facilities. Once integrated, the LRDP system can be used to test all of the tanks in a fuel farm or bulk storage terminal.

The Low Range Differential Pressure (LRDP) leak detection system for bulk fuel UST's has been listed in the EPA's "List of Leak Detection Evaluations for Underground Storage Tank Systems- Sixth Edition," published August 23, 1999. The LRDP system now meets both monthly and annual test requirements with one system. See <http://www.epa.gov/swerust1/ustsystm/nwglde.htm> for system performance.



**Figure 1.** Schematic and installation photographs of the LRDP system.